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ABSTRACT

This document discusses how improvements in the capabilities of the intelligent communications network are making new enhancements and advances available to educators, administrators, students, parents, and the community, focusing on the role of Ameritech. Modern technologies can create dynamic and appropriate learning environments for children used to the age of television. Some schools have begun to take advantage of telecommunications technology. Classroom technology will prepare students for the technical workplace. In time, the intelligent network supporting advanced telecommunications technologies could function as an electronic superhighway for schools, homes, and offices. Specific examples are given of Ameritech's technology in the classroom. The new SuperSchool, introduced in 1992, is a fully functional model of integrated information and telecommunications tools for education. Ameritech involvement is contributing to educational improvement in a distance learning project in Carpentersville (Illinois) and in Project Homeroom in Chicago (Illinois), as well as in applications in other Illinois cities, and in Indiana and Michigan. Ameritech has made generous financial contributions as well, through the Ameritech Partnership Awards and the Ameritech Foundation. Ameritech recognizes that education is the most important investment a society can make in its future. (SLD)

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SuperSchools: Education in the Information Age and Beyond

Ameritech

November 1992

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Introduction

Our next generation of Americans is reaching maturity surrounded by technologies undreamed of two generations ago, familiar with computers and fast-paced videos the same way their parents were familiar with textbooks and chalkboards. Yet, we continue to hear that our students are falling further and further behind the students of other countries, and that each year more and more graduates enter the workforce unprepared on even the most basic level.

Educators calling for new approaches

With approximately 23 million Americans functionally illiterate, and another 40 million unable to read and understand at even the eighth-grade level, educators themselves are expressing deepening concern over finding the right mix of resources and solutions to resolve the problems they see — and educators now are among the most vociferous in calling for new approaches that can lead to significant change and improvement. Increasingly, educators involved at every level of our school system see the enormous potential of information technology as one important tool to help facilitate the necessary transformation of education.

The pace of change today is measured by live news broadcasts from around the globe, and by instantaneous transmission of data, including voice, graphics, and text, across the public telephone network. These kinds of technologies have become commonplace in the business community, but remain almost revolutionary in the world of education. These technologies can play an increasingly significant role in making America's education system the best in the world. But we must make sure our teachers have access to the information tools of the 21st Century.

Educational spending on advanced technologies minimal

Information and telecommunications technologies can make classwork more interesting, can expand the capabilities of teachers, help administrators manage more efficiently and can actively involve students in the learning process. But educational spending on computer-based systems and advanced communications remains minimal: In the 1990-91 school year, schools typically spent only $35 per student on information age technology — less than 1% of their total budgets.

In this issue brief, we at Ameritech hope to explore how improvements in the capabilities of the intelligent telecommunications network are making many new enhancements and advances available to educators, administrators, students, parents, and all of those concerned about the future of our schools and our nation.

Facing the Challenge to Change the Future

The public education system in the United States suffers from the problems of society as well as from problems of its own. Each year 25% of students drop out of high school; in America's inner city schools, the figure is well over 50% and climbing. Some 700,000 students, or almost one-quarter of all graduates, leave school each year without being able to read. The consequences for American society as a whole are growing more and more significant.

- The Business Roundtable's Ad Hoc Committee on Education has estimated that as many as 60% of high school graduates are not qualified for entry-level jobs.

Few teachers have instructional access

Within the system, another set of problems exist: Too often, administrators and school boards are stymied in their attempts to effect change with limited budgets. Teachers find their interaction with professional colleagues limited and their classrooms isolating. And although many teachers can now discuss laser disks and CD-ROMs, multimedia databases and videotext, almost none actually use these resources in their courses — and fewer still have instructional access to the integrated telecommunications technology that allows these tools to work together effectively in the classroom.

- A 1991 study from the University of Michigan's Institute for Social Research shows that fewer than one in eight professors use computers for teaching.

Meanwhile, the channel-surfing MTV generation, weaned on fast cuts and slo-mo, is becoming more and more difficult to engage in the typical schooling process. Although traditionalists decry the short attention span of today's student population, recent studies have shown that, far from being unwilling or unable to concentrate, young people used to the nonstop motion-and-sound combination of television display a complex consciousness that processes facts and draws conclusions by reviewing information in brief, apparently-random "bites".

This "sampling" of the information presented allows them to mix and integrate their own reactions and deductions over a period of time. These children of the information age are less and less able to relate to, and learn from, the traditional instructional techniques of a single instructor presenting a single idea in linear fashion to a passively receptive audience.

Changing technology in a changing education environment

The power of today's emerging information and communication technologies can create dynamic, highly-productive learning environments for America's students. Information age capabilities provide the tools to capture the interest of every student; to tailor the content, methodology, and pace to the needs of the individual; and to reduce the once-intractable barriers of time, space, and monetary or population inequities. And these same technologies can expand the capabilities of America's teachers and administrators, cutting both costs and time while increasing both systemic and individual efficiency and productivity. The possibilities to transform and improve our education system explode when we consider how advanced information age technologies will transform American society in the 21st Century:

- Advanced telecommunications technologies will allow students across the nation to download video, audio, and text information from centralized databases. Educational resources could be shared equally, so that more students benefit from the system. Online multimedia "libraries" and dial-up hotlines can offer access to new worlds of knowledge for individual students and entire classes, no matter where their schools are located. Through *distance-learning*, high school students in remote rural schools can use interactive video teleconferencing to "attend" college classes, or eighth-graders in a French class in Chicago can converse not only with their peers in Cleveland, but with their counterparts in an English class in Paris.

Some schools taking advantage of telecommunications technology

Some schools already have begun to take advantage of the power of advanced telecommunications technology. Using "hotlines", parents and students can dial into a menu of recorded information on class activities, homework assignments, sports and meeting schedules, and even lunch menus; schools offering hotlines report increased parental participation, improved student performance, and reduced absenteeism and disciplinary problems. Electronic mail systems allow students to create study teams with others from diverse cultural and geographic orientations; to share assignments, research, and results; and to communicate with subject matter experts for firsthand knowledge and experience.

Future-minded educators are discovering that online services like databases offer many resources specifically designed for educational purposes, including computer-aided instructional software, interactive tutoring and test preparation, library catalogs and indices, encyclopedia and book texts, newspaper and journal reports, interactive polls, educational games, school and youth bulletin boards, and lists of educational conferences, teaching tools, and research projects and the people involved in them. And administrators are pioneering ways to use telecommunications to improve and ease teacher training; coordinate management communications; simplify recordkeeping and exchange; and support sharing of sparse resources.

Advanced telecommunications can be key to advanced education

The key to effective use of information and computer technologies is a sophisticated digital public telephone network — an intelligent network. It has been noted that teachers are the only professionals in America without direct access to a telephone in their workplace; in fact, telecommunications lines are scarce almost everywhere in the education environment, a situation where the full impact of this scarcity has only in recent years come to be understood and questioned. Yet advanced telecommunications options already available on the public network today can offer three distinct levels of technological capability:

- Currently, advanced public network switching systems can support enhanced communication options like call waiting, distinctive ringing identification, call conferencing among several parties, the use of personal computers via standard telephone lines, and others.
- In those areas where *Integrated Services Digital Network* (ISDN) capabilities are in place, such sophisticated broadband functions as simultaneous voice and data transmission, automatic caller identification, still color-image transmission and video, and electronic data interchange already are available to public network users, at speeds up to 40 times faster than older transmission techniques can support — providing a foretaste of the future without requiring the installation of full fiber-optic cable facilities.
- At its most advanced, the intelligent, fully-digital telecommunications network will encompass universal fiber-optic transmission, providing full-motion video and videotext, interactive voice and data, and transmission speeds and volumes of calls well beyond anything now available except on expensive, private networks.

Technology can reshape our education system

The technological revolution that has shaped our society will reshape our education system. Today's communications technologies can enable parents and experts to actively participate in students' progress through voice mail and electronic messaging. Telecommunications technologies can integrate the 15,000 school districts in the United States and deliver an array of resources — from research databases to dramas and documentaries to interactive videotext — to teachers, administrators, and students alike. In the very near future, our public telephone network — not the five or six copper wires common today, but broadband facilities linking classrooms to the "information highways" of the world — can serve as the backbone for the efficient deployment of these kinds of technologies in classrooms, homes, and offices at every level.

Role of Advanced Telecommunications Technology in Education

Our public school system was once the most advanced and enlightened in the world. Today, however, our traditional system of education cannot provide either equitable access to the best resources — teachers, materials, libraries and information — nor can it support individually-paced instruction that integrates the broadest range of needed subjects — determined to be the most effective mode of participation in the learning process. To many educators, as well as to legislators, employers, and parents, this inability to deal with identified problems is proof not just that students are failing in our schools, but that our society at large is failing its children.

Classroom technology prepares students for technical workplace

The growing capabilities of already-available advanced telecommunications technologies can enhance, expand, and ultimately revamp the way we educate our school-age population from kindergarten through college, with new techniques for instruction, study, research, and virtually every daily interaction. Electronically-delivered classwork can integrate text, sound, and pictures, successfully capturing the attention of students accustomed to computer games and music videos. Tapping into databases allows students to research specific, just-in-time information, making studies more relevant to their lives. And using technology in the classroom helps prepare students for the increasingly technical workplace. The benefits of information age technologies, and the advantages advanced high-speed telecommunications can offer to aid educators, however, can only be harvested when the universal intelligent public network is able to make sophisticated instructional and administrative techniques available to everyone.

Communication and information superhighways

The universal intelligent network supporting advanced telecommunications technologies could function as an "electronic superhighway" for schools, homes, businesses, and government offices across the nation. Computers, research databases, interactive text and video, CD-ROM, satellites, and other technologies all can use the same network. That can mean more interesting classwork, more capable teachers, more engaged students, and more efficient schools. Throughout the Ameritech five-state region, instead of passively listening to lectures from textbooks, advanced technologies today allow students to take an active role in their own educations.

Throughout Michigan's Eastern Upper Peninsula region, educators expect these new distance-learning capabilities to help their schools overcome the disadvantages that often accompany rural isolation. The Peninsula encompasses 11 local districts covering 3,800 square miles, including Mackinac Island — which during the winter is accessible only by airplane or snowmobile over Lake Michigan. The Mackinac Island school serves only 72 students, while 7 of the area's other high schools have student bodies of fewer than 140 each. Jack Thompson, director of the district's Regional Education Media Center, says that in the past students often had to be bused up to 80 miles away to share teachers or resources, especially for such classes as foreign languages, art, business, or math. Now, says Thompson, "We'll create class sizes that justify an Advanced French or Calculus course...[and] teachers can focus on their specialities, instead of jumping from subject to subject."

Continuing education made possible for all

Thompson adds that another important factor will be the capability to offer continuing education and extension courses to almost everyone. "In the Upper Peninsula," Thompson says, "working parents who want...to advance professionally may have to drive 40 or 50 miles to Lake Superior College in Sault Ste. Marie...[but] now that the university will be connected to the communities on the interactive system, students will be able to attend classes locally." Educators in the Peninsula region believe that by enhancing educational resources at all levels, they will be helping to promote and improve economic and social development throughout their communities.

- The Indianapolis Public Schools (IPS) and Indiana Bell have launched what is believed to be the world's largest fiber optic interactive distance-learning network, using more than 600 miles of fiber optic facilities to link more than 90 school locations for two-way video conferencing and closed-circuit television usage that allow multiple sites to communicate simultaneously.

Using technology to support an anti-drug message

In May, 1992, nearly seventy guidance counselors at five public school sites took part in a drug seminar with experts from Milwaukee and Indiana University in Bloomington in the network's first trial. The IPS installation will be fully operational for the 1993 year, interconnecting grade schools, middle schools, administrative buildings, and the district's Center for Instructional Radio and Television.

- In the Appalachian region around Athens, Ohio, Ohio Bell is working with third and fourth grade elementary school classes and the Ohio University College of Education to develop three distance-learning projects linking the schools with the University's teaching resources, to give some of America's most financially-underprivileged children access to the highest quality education available in the area. Other such networks are now being installed to connect fifteen schools in Findlay, Ohio, and five high schools in Columbiana County.

Ohio University also is using the network to train future teachers in the use of this advanced technology. Using Ameritech interconnections for two schools, students can take full advantage of the broadcast-quality, two-way, full-motion video capabilities to ask questions, pose hypotheses, "sit-in" on experiments conducted by professors at University laboratories, and evaluate the outcome of those experiments. These interconnections allow using such multimedia tools as overhead projectors, cameras, CD-ROMs, laser disks, scanners, VCRs, and PCs with graphics software over the interactive video links.

OPTINET enables full-motion video capabilities

Ameritech Technology at Work in the Classroom

Although the U.S. remains the most-developed country in the world, our educational system continues to try to use the techniques of the industrial age to prepare our students for the information age. Today's advanced telecommunications technology can offer a broad range of options and alternatives to maximize the educational process at every level. And it can be viable for every type of institution, from suburban elementary and grade schools through large urban high schools, and from small rural one-room schoolhouses through community colleges, vocational and technical schools, private universities, and corporate training programs. Examples of these kinds of applications, and their myriad advantages, already can be seen in the many existing and planned school-based projects throughout Ameritech's operating region.

Education must use 21st Century techniques to train children of the Information Age

Ameritech's new SuperSchool is a fully-functional model of integrated information and telecommunications tools for education that supports more than 30 advanced technology applications. SuperSchool was launched in 1992 with knowledge that Ameritech had gained from elementary, secondary, and university educators; we then asked communications hardware and software makers to work with us and the educators to integrate these ideas and make them real.

SuperSchool: Flagship for the future of education

- A key element of the SuperSchool working model is the focus on technologies and capabilities currently available via the public telecommunications network.

When first debuted in the Spring of 1992, a SuperSchool exhibit demonstrated a state-of-the-art home-learning center that included 24-hour voice response hotlines and ISDN-based desktop conferencing; new *VideoWindow* interactive remote teleconferencing capabilities to interconnect students, educators, and subject experts in communities around the country and the world; and an advanced studies and resource center supporting multimedia library and database networking, in addition to the *SuperBook* hypermedia system that integrates audio, video, images, data, and text at the student workstation.

SuperSchool model demonstrates a variety of applications

Among the many other applications demonstrated within the SuperSchool model are distance-learning classes between U.S. sites and the Montreal World Trade Center; a user-controlled weather lab that offers a thunderstorm simulation made possible through connections to a remote supercomputer; and a visualization experiment that creates a four-dimensional image of a dog's heart, a computer hookup with an interactive anatomy program and an electronic database library.

- The SuperSchool exhibit also provides an administrative center that uses cellular mobile telephones, interactive voice response, and online electronic mail via personal computers and local area networks. These capabilities enable teachers and administrators to choose the most appropriate function for any given task, at any time of day to make their schools more efficient and their communications more effective.

Classrooms without walls: Distance learning in action in Illinois

In once-rural Illinois Community Unit School District 300, educators have found the demographics of their swiftly-changing district putting new strains on existing facilities and staff. As large businesses move from metropolitan Chicago into the Carpentersville area, a new population of employees and families are turning this region, for generations a quilt of farms with widely-scattered residents, into a growing suburbia. The district now serves more than 11,000 students in 13 urban, suburban, and rural communities, representing a broad range of socioeconomic, ethnic, and racial backgrounds. Funding for facilities and teachers cannot yet keep up with the volume and diversity of new students, so Carpentersville is testing more innovative, cost-effective ways to offer the largest number of students the best quality of education.

Distance learning broadens rural education experience

- The Carpentersville experiment in interactive distance-learning connects the district's 3 high schools over Ameritech's advanced digital links for efficient sharing of limited resources. One of the schools has only 270 students, while the others have 1,400 and 1,200 respectively. The project enables a single instructor to teach all 3 classes simultaneously, eliminating the need to transport the students between schools.

Telecommunications can help teachers develop new teaching approaches

- An important element in the Carpentersville trial was training for maximum effectiveness in this new environment. With a teacher-training grant from Illinois Bell, the schools established workshops with members of Northern Illinois University to help them master techniques for involving students at all locations, not just those physically present in the room with the teacher. A key factor, the teachers found, was that they themselves needed to think more broadly about their presentations, manipulating the full capabilities of the new medium in order to keep the sessions lively but controlled, and to ascertain the students' level of understanding of the materials.

The initial distance-learning effort brought together, via sophisticated telecommunications, social science classes in each of the schools for a joint session and discussion group on foreign affairs. The trial was so successful, with students in all the classes demonstrating an unanticipated level of interest and enthusiasm, that the schools now are working to develop joint curricula that will extend the teleconferencing instruction into more courses, especially in the areas of math, language, art, and business. The schools expect that the new system will be of special value in courses for the most-highly able or gifted students, typically a very small group with particular study requirements.

- And teachers in District 300 now use the distance-learning network to hold meetings, and even impromptu after-school discussions. Carpentersville administrators and teachers feel that they are positioning themselves for the future, when they believe that advanced telecommunications and information technologies will impact every aspect of their own as well as students' lives and careers.

Project Homeroom: Stimulating creative thinking through multi-disciplinary home-learning

In the 21st century, school days likely will be structured quite differently from their modern-day counterparts. Classes will be multi-disciplinary, with related subjects grouped by theme, and geared to enable individuals to pace their own progress. In Chicago, Ameritech Services, Illinois Bell, and IBM are making the future reality through their joint effort called *Project Homeroom*, a trial program to provide area public schools with computers and advanced data communications capabilities that will allows students and teachers to extend the learning process beyond the traditional school day.

Project Homeroom provides more than 500 high school, junior high, and elementary students and teachers with computers linking their homes to nationwide databases, such as national news services, online encyclopedias, science and financial statistics, and their own and other school and university libraries. In one school in the project, through the use of simultaneous integrated voice, data, and video capabilities, students have round-the-clock access to all these learning materials over a single telephone line. And the family is able to continue using their standard voice telephone service while the student's home computer is interacting online.

- Project Homeroom teachers also have home computers and are available through a modem-and-message system to assist students after school hours. Both students and teachers are able to communicate with each other through the program's online electronic mail and conferencing functions.

Project Homeroom improves information access and processing skills

A major goal of the project also is to increase communication between students, parents, and the schools, by improving information accessibility and processing skills through accelerating the use of common technologies in the classroom setting. Project Homeroom incorporates teaching skills enhancement as well, enabling teachers to learn new methods using the most up-to-date computer and telecommunications tools. For parents as well as teachers and administrators, Project Homeroom benefits include being able to immediately check a student's progress by accessing electronic on-line grade-books, progress reports, and bulletin boards listing current assignments.

Information resources and exchange available to all through universal intelligent network

These programs and others are changing the way teachers and administrators can most effectively and efficiently perform their jobs. They are changing the ways that students directly and indirectly benefit from their schools. Advanced technologies will play a growing and vital role in our future education system as they are adapted to support educational applications. Information resources and exchange will be available to all, regardless of their location.

- One of the most significant new networks with which the public network must be able to interact is the National Research and Education Network (NREN) which will connect more than 1,000 schools and research institutions across the nation. As the information age becomes pervasive in the nation's classrooms, the public network can play a central role in ensuring all students access to this powerful educational tool.

New technology needs in today's education

From Connecticut to Kentucky to California, states are working to reform their educational systems by adding technology. New technological capabilities are being deployed to benefit the overall operations of schools as well as interactions with students, parents, and others in the community. The ever-increasing need for scientific and technological education, both in curricula and in instructional techniques, only emphasizes the need for our educational system to make dramatic and swift changes in order for American students to keep pace with societal changes, and to be able to hold their own in the information age against students and workers around the world.

- At the University of Illinois at Champaign, the University's Computer-based Education Research Laboratory through support from Illinois Bell, is conducting a pilot program linking six schools in Chicago and East St. Louis for access to on-line courseware from the University's NovaNet computerized educational system.
- Indiana University is working with Indiana Bell to explore the educational and technological possibilities for teaching using two-way, broadcast-quality video links between the university instructors and students in Bloomington and Indianapolis.

- At Mumford High School in Detroit, Michigan Bell and the Ameritech Foundation funded the design and development of a high technology communications learning center. This center uses the local area network provided by Michigan Bell Communications and makes it possible to share software for different subjects. The center includes computers, CD ROM, laser discs and scanners, and laser printers, and is designed to encourage students to work at their own pace. The center's math, English and science resources are part of the curriculum of the entire school. The work stations also allow users to link with other schools, publish newspapers, produce video term papers and conduct research. This center is the only one of its kind in Michigan and is a proven example of where the integration of technology and education has proven to be a successful combination — providing students with new and innovative ways to learn.

Intelligent network also offers benefits to education administration

The growing capabilities of the intelligent network also are changing the administrative side of the education system: Meetings, conferences, and workshops can be held over the telecommunications network, eliminating the need for travel and time spent away from school. Initiatives from governing boards and state agencies can be widely disseminated in the most timely way. Voice-response applications, in the form of education hotlines, help schools involve parents and communities in the education process. Electronic mail and voice messaging services enable students, parents, teachers, and administrators to interact individually or in groups at any time of day or night, at their own convenience.

Other administrative telecommunications tools can include online access to class records to help schools manage attendance reporting, critical for government funding. New telephone-company-based services could help administrators track and regulate temperature, lighting, and other facilities in the school buildings over dial-up information and control systems. And with increasing discussion of extending the school day or year, home learning capabilities via advanced telecommunications networks can help cut costs significantly, when compared to keeping traditional buildings open and fully staffed.

Increased capabilities and better communication impetus behind educator interest

The potential for increased capabilities and for better communications leading to a better educational system is a strong force behind educators' interest in information technology. The potential for expanding as well as enhancing the educational process seems unlimited when telecommunications technologies can be used to share faculty and staff development programs; establish remote extension sites for adult continuing and community education programs; provide computerized career planning, over shared regional networks; offer specialized training for business and industry to the widest audience at the lowest cost; and link both cable and satellite television, such as the Public Broadcasting System and the National Narrowcast Service, to numerous school sites for telecourses and study groups.

A public intelligent network is a key to success

But unless the supportive capabilities of the intelligent network are already in place and can be relied on, too many school systems will be unable to invest in new technologies for their own schools. And the nature and speed of implementing these kinds of advanced technologies could be jeopardized if the infrastructure of the public telephone network is unable to support them equally.

Ameritech Meets Education's Needs Through Telecommunications

A natural partnership: Education and information technology

In recent years, the logic of linking education with information technology has become self-evident. As this logic grows more compelling with each year, many new avenues for partnerships between educators and technology providers have opened — in turn opening up new vistas for improvement and enhancement of our entire educational system. We recognize that technologists and educators must work together.

- Educators must become aware of the technologies available and the benefits they can bring, and those in the communication and information industries must learn the needs and priorities of educators in order to provide the most appropriate and effective technology tools.

Ameritech contributed more than $3.5 million to education in 1991

At Ameritech, we have reinforced our commitment to quality education for all, contributing more than half of our $7.5 million in contributions in 1991 to technology innovations, support programs, and outright grants. A majority of these contributions directly targeted programs and schools at the elementary, secondary, and higher education levels.

- This year, our $10,000 Ameritech Partnership Awards were distributed among 25 colleges throughout the Midwest in support of new programs demonstrating the distinctive value of independent higher education. These awards recognized the value of many different programs aimed at enhancing educational opportunities for older Americans; recruiting and rewarding minority students; assisting the academically disadvantaged; and developing critical resources through volunteerism.
- Similarly, the Ameritech Foundation, our philanthropic arm charged with offering support for a range of charitable educational and scientific programs, recently awarded $5.4 million to Case Western Reserve University, Indiana University, Northwestern University, and the University of Chicago. These awards will be used to help those institutions establish faculty chairs in areas of research ranging from regional economic issues to communications engineering to public policy.

Ameritech is committed to an advanced telecommunications infrastructure

Ameritech recognizes the importance of incorporating information age technologies in all areas of education, and we are committed to unlocking the full potential of the future universal advanced telecommunications infrastructure, comprising broadband intelligent networks crisscrossing the nation, to enable universal information access and exchange in order to renew and reform the American educational process. Ameritech's efforts to respond to the special needs and goals of educators and students in our region, and across the nation, of course includes the swift and efficient implementation of current network advances, and the development of long-term plans for putting advanced intelligent telecommunications in place throughout our five-state operating area.

- Standard telephones, personal computers, minicomputers and mainframes, videotext networks, public databases, imaging systems, and even broadcast satellite and cable television could all be linked over the future fiber-optic public network. This would link every home, business, workplace, library, classroom and laboratory, research center and university, even every government agency — making each one accessible from every other point on the network.

The potential for improved teacher motivation and performance; better-educated and better-prepared students; and more efficient and effective school administrations, boards, and education departments all emphasize the critical nature of these advanced capabilities. The positive effects of the many advances and potential benefits that can stem from intelligent network technology are reflected in the savings of time, effort, and society's costs of those whose needs are not being met by our current education system.

Closing Thoughts

Education: Most important investment in the future

Ameritech Chairman and CEO William L. Weiss has said that education is the most important investment any society can make in its future. With U.S. industry currently spending an estimated $25 million on remedial education and training, the need to prepare our next generation of Americans to take their place in the workforce is most often cited as the primary driving force for the adoption of advanced telecommunications technologies throughout the educational arena. Until the element of telecommunications is factored in, information technology cannot fulfill its promise.

The importance of today's telecommunications technology to educators, students, and employers is easily seen in the growing potential for improved curricula development and more immediately-relevant teaching methods, and for more effective and efficient communications in all areas, leading to better attendance, attention, and retention on the part of students. Progressive state education departments are already using limited, local, fiber-optic networks. But, although a universal, advanced public network has been the focus of much public debate, progress has been slow because of a lack of public understanding of the technologies, their benefits, and what's necessary to make them possible for everyone.

Modernization of the public network is imperative

Nationally, the United States is beginning to lag behind other countries in information age capabilities. The public network must be upgraded and equipped to handle the increasing number of calls and the diversity of transmissions required to support the sophisticated telecommunications equipment and applications now available.

Technology infrastructure not yet available

Throughout the U.S., the high-traffic routes between telephone company switching centers are capable of handling advanced technologies, whereas the connections in the so-called "last mile", which connects your local switching center to your home or school, are not. The technological infrastructure necessary for the most effective and efficient use of these advanced telecommunications capabilities is simply not available or accessible everywhere.

And this situation is common throughout our country, where the most advanced telecommunications technologies are simply not readily available to schools and other nonprofit institutions. Although the United States pioneered computer and telecommunications technologies, in many ways the lack of a national vision has slowed access to potential applications and innovations — and thus has slowed the development of even further advances.

Public policy and the roadblocks to full information age participation

Obsolete public policy, however, even today is hindering the efficient and cost-effective implementation of universal intelligent telecommunications technology, both from the standpoint of outdated legislative/regulatory roadblocks still in place and the need for a better- informed vision of information age capabilities and requirements when making future policy decisions.

Historical models of regulation have tightly controlled the deployment of new investment in new technologies. Such a system can only work when the regulated company is a monopoly. Only then can regulators, rather than the marketplace, determine what rates are reasonable and what investments in new services are appropriate. Only then can regulators "guarantee"a steady return to investors.

The old approach to regulation was never intended to work in the competitive world. In fact, it is a system developed as a substitute for competition.

Furthermore, the old system was devised at a time when we could scarcely imagine the diverse role the telecommunications network would come to play in a global information economy, education, health care, and our overall quality of life. Rather, the goal of regulation in those early days was simply to make basic voice telephone service available and affordable to anyone who wanted it. New technologies were introduced under this system, but in a very controlled manner.

Regulatory policy should manage competition

In order to be effective competitors and in order to remain attractive to outside investors, the Ameritech companies need state and federal regulators to recognize that competition needs to assume a more powerful role in regulating our business.

Regulators can continue to protect consumer rates while promoting competition and investment in an advanced telecommunications network by focusing regulation on prices instead of company earnings.

A network of networks

In the future, consumers' telecommunications needs will be met by a network of communication networks. We believe that for the public network to play the central role that it should play, we must develop this new approach to regulation.

A battleground between the "data haves" and "data have-nots"

If the public network is not enhanced to provide the necessary technological capabilities, or if the industry is hampered by newly proposed restrictions, the United States is vulnerable to become a battleground between the "data haves" and the "data have-nots". Those school districts and state school systems that can afford to build and maintain extensive and expensive private networks would be pitted against those who are forced to rely on the public network, which could become easily outdated. Such a situation would have a profound impact on the basis of American public education, which strives to provide a solid, equal education to all. In addition to schools, such "data have-not" communities and their economies would likely continue to fall behind as home-owners choose not to locate in those school districts, and as shopping areas and economic growth follow housing developments and strong neighborhoods.

As American society grows more dependent on technology to provide and safeguard the highest standard of living in the world, we at Ameritech want to ensure that all segments of our society have access to the increasing scope of telecommunications products and services considered vital. At Ameritech, we are committed to improving the quality of education and making certain that similar education services are available to every school.

Ameritech's commitment is to bring the Information Age to everyone

We believe that our chief contribution to this goal lies in our commitment to making the universal intelligent telecommunications network a reality. We seek to develop new partnerships with our customers and stakeholders, in order to fulfill the promises of the information age. We welcome a dialogue with eveyone concerned with this issue throughout the Ameritech region.

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